

REMARKS/ARGUMENTS

Claims 1-5, 9, 11-12, and 14 are pending. Claims 1-5, 9, and 12 have been amended to more particularly point out and distinctly claim Applicants' invention. Claims 6-8, 10, and 13 have been canceled without prejudice and without disclaimer. Claim 14 has been added. No new matter has been introduced thereby. Applicants respectfully submit that the claims as amended comply with 35 U.S.C. § 112.

Claims 1-5, 9, and 11-12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Rabinovich (U.S. Patent No. 6,256,675).

The Present Invention

The present invention is related to reducing traffic between networks. If a target-file on a file-server in a network is frequently accessed, then the file-server searches another network in which a client accessing the target-file belongs to and searches an appropriate file-server in the proximity of the client in another network and the file-server. The present invention achieves to maintain a consistency of data, to incur no overhead, and to reduce traffic between networks. See, e.g., FIG. 5 and page 18, line 10 to page 20, line 5 of the present specification as originally filed.

Rabinovich

Rabinovich merely discloses that replicas are migrated, deleted, and copied according to a frequency of accesses. See, e.g., column 10, lines 41-45. The data migration is performed in order to increase a frequency of accesses and is effective if used in conjunction with the deletion and the replication of data.

Rabinovich's method is directed to replicating a category of objects that can change only as result of updates by the content provider. An overwhelming majority (over 90%) of Web object accesses fit in this category of objects. Consistency of updates can be maintained by using the primary copy approach, with the node hosting the original copy of the object acting as the primary. Depending on the needs of the application, updates can propagate from the primary asynchronously to the rest of the currently existing replicas either immediately or in batches using epidemic mechanisms. These objects can be replicated or

migrated freely, with the provision that either the primary copy of an object never migrates or the location of the primary copy is tracked by the redirection module. See, e.g., column 21, lines 12-45 of Rabinovich.

In other words, according to Rabinovich, the data is synchronized, that is, to maintain the identity of data among an original file(s) and a plurality of replicas of the original file(s) (consistency control process). The consistency control process is more time consuming as the distance increases between a computer storing an original/replica and a (remote) computer storing a replica. Further, in cases where the original file(s)/replica are updated frequently by one computer, the consistency control process is also required frequently; thereby, the latency is remarkably increased.

Claims 1-5

Applicants respectfully submit that claim 1 is novel and patentable over Rabinovich because, for instance, Rabinovich does not teach or suggest a second program that is executed depending on the access situation, wherein the second program includes a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network.

In the system of the present invention, each file server checks the contents of its access statistics table at certain periods and determines whether or not frequent accesses to a file (managed by the file server) have occurred from clients of a particular network group (access from a network group). If such a file is found, the file server designates the file as a candidate for the migration. A first server (having a disk storage device storing a file being accessed by a client) checks location information of a network including the client and determines client servers for the destination of the file migration. The first server transmits a migrator acceptor search packet to unspecified number of servers on the network including the client (or on networks in the proximity of the network including the client) in order to search for the acceptor of the file. A second server which received the migratory acceptor search packet transmits a migration admittance packet (indicating acceptability of the file) to the first server. The first server checks the contents of the migration admittance packet and if the second server is found to be suitable for the migration, transfers the file to the second server. The first server further transmits an advertisement packet (indicating the migration of

the file) to the network including the client accessing the file (or to networks in the proximity of the network). Thereafter, the client makes access to the transferred file by accessing the second server. See, e.g., FIG. 5 and page 18, line 19 to page 20, line 5 of the present specification as originally filed.

On the contrary, Rabinovich discloses a computer system comprising a plurality of hosts and a request distributor in one network, which is pointed out by the Examiner. Rabinovich also discloses that a host "periodically performs a method to decide on replica replacement" in column 14, line 44 to column 15, line 34. As a result, Rabinovich's method causes the network traffic to increase because Rabinovich's method requires synchronization between replicas on entities. Therefore, Rabinovich does not, depending on the access situation, execute a program that includes, among other modules, a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network. More specifically, the file server in the present system checks the contents of its access statistics table at certain periods and the server performs a migration method only when there exists frequent access to a file (managed by the file server) from clients of a particular network group (access from a network group). In addition, the claimed invention discloses searching within a second network for file migration. The claimed features are absent from Rabinovich.

Applicants also note that claim 1 recites a computer system comprising a first network, a first computer connected to the first network, a second network connected to the first network, and a second computer and a third computer connected to the second network. In contrast, Rabinovich discloses a computer system comprising a plurality of hosts and a request distributor in one network.

For at least the foregoing reasons, claim 1 is novel and patentable over Rabinovich.

Claims 2-5 depend from claim 1, and are submitted to be patentable as being directed to additional features of the invention as well as by being dependent from allowable claim 1. For example, claim 2 recites, "a module for designating the file corresponding to the access situation information as the candidate for migration when the information satisfies a predetermined condition." This feature is neither taught nor suggested in the cited reference.

Rabinovich merely discloses that "every entity (i.e., host, computer, or the like) may be a good candidate for placing a replica" in column 14, lines 7-24 which is pointed out by the Examiner. As a result, Rabinovich's method causes the network traffic to increase. Rabinovich requires synchronization between replicas on entities.

In another example, claim 4 recites "a module for making access to the second computer for the file according to the advertisement packet." As commented by the Examiner, Rabinovich indicates that request distributor/replicators in an area are always in communication with other requestor distributors/replicators because the request distributor always selects a host based on calculated values of distance metric and the distance metric in accordance with Rabinovich's method. However, the claimed invention does not require such an always-communication because the communication is required only when necessary in accordance with an access table. See, e.g., page 18, lines 10-18 of the present specification.

Claim 9

Applicants respectfully submit that claim 9 is novel and patentable over Rabinovich because, for instance, Rabinovich does not teach or suggest a second program that is executed depending on the access situation, wherein the second program includes a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network.

As discussed above, Rabinovich fails to disclose or suggest a second program that is executed depending on the access situation, wherein the second program includes, among other modules, a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network. For at least the foregoing reasons, independent claim 9 is novel and patentable over Rabinovich.

Claim 11

Applicants respectfully submit that claim 11 is novel and patentable over Rabinovich because, for instance, Rabinovich does not teach or suggest a module for making access to the file via an interface of the second computer to the second network using a path name after reception of the path name to a third computer as a destination of the file transferred from the first computer.

Rabinovich is related to storing a replica of an object at a second host within the network 102. See, e.g., column 6, lines 17-29 and FIG. 1. Rabinovich merely discloses that replicas are migrated, deleted, and copied according to a frequency of accesses. Rabinovich does not teach or suggest a second network, and thus does not teach a module for making access to the second network.

For at least the foregoing reasons, claim 11 is novel and patentable over Rabinovich.

Claim 12

Applicants respectfully submit that claim 12 is novel and patentable over Rabinovich because, for instance, Rabinovich does not teach or suggest a second subroutine that is executed depending on the access situation, wherein the second subroutine includes a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network.

As discussed above, Rabinovich fails to disclose or suggest a second subroutine that is executed depending on the access situation, wherein the second subroutine includes, among other modules, a module for searching the second network connected to the third computer and a module for searching a candidate for migration for the second network. For at least the foregoing reasons, independent claim 12 is novel and patentable over Rabinovich.

Claim 14

New claim 14 is submitted to be patentable as being directed to additional features of the invention as well as by being dependent from allowable claim 1. For example, Rabinovich further fails to teach or suggest a module for transferring a directory belonging to the file to the second computer. The claimed invention achieves to transfer not only a file but also all files in a directory. See, e.g., page 22, lines 19-24.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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